

Short communication

FIRST RECORD OF THE JAPANESE GRAPE LEAFHOPPER *ARBORIDIA KAKOGAWANA* (HEMIPTERA: AUCHENORRHYNCHA: CICADELLIDAE: TYPHLOCYBINAE) IN SERBIA

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The most recent findings on allochthonous Auchenorrhyncha species in Serbia have reported two Typhlocybinae (fam. Cicadellidae) species new to the local entomofauna: *Tautoneura polymitusa* Oh & Jung, 2016 and *Erasmoneura vulnerata* (Fitch, 1851) (Kosovac *et al.*, 2020; Šćiban & Kosovac, 2020). A further survey in 2020 revealed the presence of another alien typhlocybin species, *Arboridia kakogawana* (Matsumura, 1932). This East Asian species, known as the Japanese grape leafhopper, was recorded on the European continent for the first time in the Krasnodar area of the southern Russia in the early 2000s (Sugonyaev *et al.*, 2004; Gnezdilov *et al.*, 2008a). Soon after, it was detected on the Crimean Peninsula (Radionovskaya & Didenko, 2014; Radionovskaya & Didenko, 2015), while its first occurrence on EU territory was recently reported in Romania (Chireceanu *et al.*, 2019). Each finding portrayed *A. kakogawana* as a phytosanitary risk for local grapevine production due to the intense feeding of its nymphs and adults on leaf mesophyll, consequently affecting grape maturation (Gnezdilov *et al.*, 2008b; Chireceanu *et al.*, 2019).

The first specimens of *A. kakogawana* in Serbia were collected in July 2020 in the Novi Sad city center (northern Serbia, Vojvodina province). A single *A. kakogawana* adult specimen was attracted by a light trap set in a house backyard on 26.07.2020. Three more specimens were collected in the following days (29.07.2020), while a dozen more individuals were attracted by the light trap through the end of August. All individuals were easily identified as *A. kakogawana* by their bright yellow habitus, brown-to-orange forewing venation, and vertex and upper angles of the scutellum with a pair of black spots (Gnezdilov *et al.*, 2008b). Another *A. kakogawana* occurrence in Novi Sad was recorded in Klisa suburb (5 km from the city center-site) on August 10, when two individuals were observed on healthy *Vitis vinifera* L. plants.

The second locality was in the town of Srbobran, 35 km north of Novi Sad. An abundant *A. kakogawana* population was observed on 08.08.2020 on two old *V. vinifera* plants in a private garden. More than 50 individuals (adults and nymphs) were easily swept from the grapevines (Fig. 1B). Syntopically, *A. kakogawana* was also present on Virginia creeper (*Parthenocissus quinquefolia* L.). Grapevine plants that hosted *A. kakogawana* had characteristic infestation symptoms: bleached dots and chlorotic patches (Chireceanu *et al.*, 2019). Several *Empoasca* sp. individuals were also collected, as well as 1 ♂ *Ribautiana tenerrima* (Herrich-Schäffer, 1834).

Soon after, on 15.08.2020, damaged *V. vinifera* plants were observed in the Belgrade suburb of Zemun. They were colonized by an abundant *A. kakogawana* population from which more than 20 specimens were easily sampled, and hundreds observed (Fig. 1A, 1C).

At the end of August 2020, two *A. kakogawana* specimens, out of cca. 20 observed, were collected in the town of Crvenka (northern Serbia, Vojvodina province) on healthy grapevine plants in a private garden. As in Srbobran, *Empoasca* sp. was also present on the inspected plants. This locality is the northernmost site of *A. kakogawana* occurrence in Serbia recorded so far.

All sampled individuals were stored in 2-ml plastic tubes filled with 96% ethanol and kept in a refrigerator at 4°C until further morphological analysis. Outer morphological characters and male genitalia were examined under BTC STM4c-LED and Leica MZ7.5 stereomicroscopes. Photographs of the collected individuals were taken using an Honor 7 Lite and iPhone 6s phone camera. Photographs of the *A. kakogawana* aedeagus were taken with an Olympus CX41 microscope with 400x magnification and attached Huawei p20 phone camera. All collected individuals with corresponding aedeagi in glycerol are deposited in Marko Šćiban's private entomological collection.

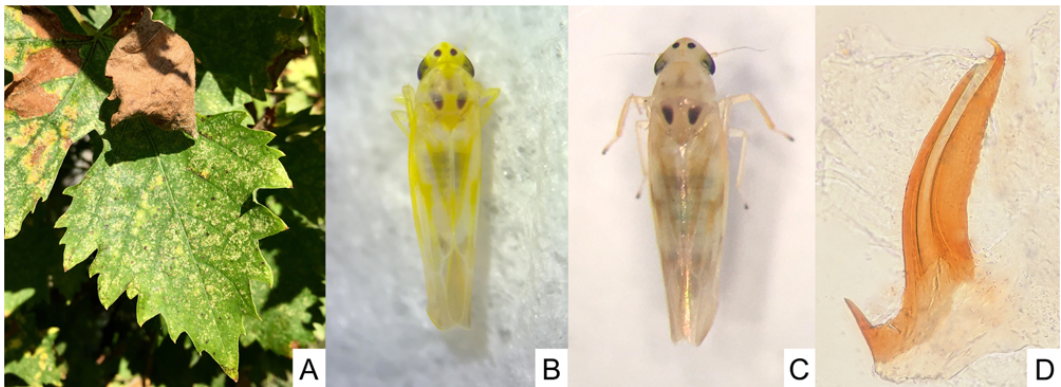


Figure 1. Symptomatic *V. vinifera* colonized by *A. kakogawana* in Belgrade (A); *A. kakogawana* specimens collected from *V. vinifera* in Srbobran (B) and Belgrade (C) and *A. kakogawana* aedeagus lateral view (D).

Examined material:

Arboridia kakogawana (Matsumura, 1932)

Serbia: Novi Sad, city center, 45°15'38.0" N, 19°50'45.6" E, 29.07.2020, 2 ♂♂, 2 ♀♀, collected on a light trap; Novi Sad, Klisa, 45°17'52.5" N, 19°49'59.0" E, 10.08.2019, 2 individuals observed on *V. vinifera* by R. Mirić and M. Šćiban.

Serbia: Srbobran, 45°32'53.7" N, 19°47'11.5" E, 08.08.2020, 4 ♂♂, 6 ♀♀, swept off *V. vinifera*, leg. and det. M. Šćiban.

Serbia: Belgrade, Zemun, 44°51'19.3" N, 20°22'39.1" E, 15.08.2020, swept off *V. vinifera*, 11 ♂♂, 16 ♀♀, leg. and det. A. Kosovac.

Serbia: Crvenka, 45°39'15.43" N, 19°27'41.63" E, 29.08.2020, 2 ♂♂, swept off *V. vinifera*, leg. and det. M. Šćiban.

Remarks: Male genitalia were examined according to Gnezdilov *et al.* (2008b).

The finding of *A. kakogawana* contributes to the record of invasive Auchenorrhyncha species as the ninth allochthonous species present in Serbian fauna (if excluding *Phlogotettix cyclops* (Mulsant & Rey, 1855)) (Šćiban & Kosovac, 2020). Interestingly, in the Belgrade (Zemun) locality, another three invasive species were swept from the same grapevine plants as *A. kakogawana*: *Scaphoideus titanus* Ball, 1932, *Erasmoneura vulnerata* and *Stictocephala bisonia* Kopp & Yonke, 1977. In this case, the notable damage on the grapevine leaves in the form of bleaching spots (Fig. 1A) cannot be assigned exclusively to *A. kakogawana*, since a species that causes similar damage, *E. vulnerata*, was present in sympatry. A similar syntopic presence of *Empoasca* sp. on the grapevine plants in Srbobran could also have contributed to the induced leaf damage. The abundant *A. kakogawana* populations observed in Belgrade and Srbobran (cca. 120 km apart) suggest that Serbia was most likely colonized by this invasive species several years ago. The lowest number of *A. kakogawana* individuals was recorded in Crvenka, which is the most westward site of occurrence in Europe. This invasive Auchenorrhyncha species, with considerable pest potential, was detected in Serbia shortly after the first findings in neighboring Romania (Chireceanu *et al.*, 2019), indicating an intensive *A. kakogawana* expansion westward throughout Europe.

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ОТКРИЋЕ ПРИСУСТВА ИСТОЧНОАЗИЈСКЕ ЦИКАДЕ
ARBORIDIA KAKOGAWANA (HEMIPTERA: AUCHENORRHYNCHA:
CICADELLIDAE: TYRHLOCYBINAЕ) У СРБИЈИ

МАРКО ШЋИБАН, РАДИСЛАВ МИРИЋ И АНДРЕА КОСОВАЦ

Извод

До сада су у Србији детектоване само две инвазивне врсте цикада из подфамилије Tyrhlocybinae - *Tautoneura polymitusa* Oh & Jung, 2016 и *Erasmoneura vulnerata* (Fitch, 1851). Источноазијска врста, *Arboridia kakogawana*, је у Европи први пут евидентирана почетком 2000-их у европском делу Руске Федерације, док је 2019. у Румунији пријављен први налаз за територију ЕУ. Током јула и августа 2020. откривено је присуство популација *A. kakogawana* на четири локалитета у северном делу Србије – Нови Сад, Србобран, Београд (Земун) и Црвенка. На свим локалитетима *A. kakogawana* је пронађена у асоцијацији са виновом лозом; узорковано је и генитализовано више примерака, док су у Србобрану и Београду забележене и виновне лозе са специфичним симптомима хлоротичних пега на листовима који указују на присуство ове алохтоне цикаде. *Arboridia kakogawana* је алохтона цикада, највероватније присутна у Србији већ неколико година, и успешно се шири према западу европског континента.

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